

AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the present application.

IN THE CLAIMS:

1-11. (Canceled).

12. (New) A production method of polymer of conjugated dienes, comprising:
reacting conjugated dienes with a catalyst composition for polymerization of a conjugated diene, comprising: (A) a metallocene complex represented by a general formula (I): $(C_5R^1R^2R^3R^4R^5)_aMX_b \cdot L_c$ wherein M represents a rare earth metal; $C_5R^1R^2R^3R^4R^5$ represents a substituted cyclopentadienyl group selected from a 1-ethyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-isopropyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-n-butyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-trimethylsilyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-benzyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-phenyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-trifluoromethyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-isobutyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-triethylsilyl-2,3,4,5-tetramethylcyclopentadienyl group, and a 1-triisopropylsilyl-2,3,4,5-tetramethylcyclopentadienyl group; X represents a hydrogen atom, a halogen atom, an alkoxide group, a thiolate group, an amide group, or a hydrocarbon group having 1 to 20 carbon atoms; L represents a Lewis basic compound; "a" represents an integer of 1 or 2; "b" represents an integer of 0, 1, or 2; and "c" represents an integer of 0, 1, or 2; and (B) an ionic compound composed of a non-coordinating anion and a cation, and/or an aluminoxane.

13. (New) A production method of polymer of conjugated dienes according to Claim 12, wherein a polymerization reaction is performed in the presence of cyclohexane.

14. (New) A production method of polymer of conjugated dienes, wherein a cis-1,4-configuration content in microstructure of the polymer is 97.0 mol% or more; and a molecular weight distribution Mw/Mn is 2.00 or less, comprising:

reacting conjugated dienes with a catalyst composition for polymerization of a conjugated diene, comprising: (A) a metallocene complex represented by a general formula (I): $(C_5R^1R^2R^3R^4R^5)_aMX_b \cdot L_c$ wherein M represents a rare earth metal; $C_5R^1R^2R^3R^4R^5$ represents a substituted cyclopentadienyl group selected from a 1-ethyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-isopropyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-n-butyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-trimethylsilyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-benzyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-phenyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-trifluoromethyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-isobutyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-triethylsilyl-2,3,4,5-tetramethylcyclopentadienyl group, and a 1-triisopropylsilyl-2,3,4,5-tetramethylcyclopentadienyl group; X represents a hydrogen atom, a halogen atom, an alkoxide group, a thiolate group, an amide group, or a hydrocarbon group having 1 to 20 carbon atoms; L represents a Lewis basic compound; "a" represents an integer of 1 or 2; "b" represents an integer of 0, 1, or 2; and "c" represents an integer of 0, 1, or 2; and (B) an ionic compound composed of a non-coordinating anion and a cation, and/or an aluminoxane.

15. (New) The production method according to Claim 12, wherein the substituted cyclopentadienyl group is selected from a 1-ethyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-isopropyl-2,3,4,5-tetramethylcyclopentadienyl group, a 1-n-butyl-2,3,4,5-tetramethylcyclopentadienyl group, and a 1-trimethylsilyl-2,3,4,5-tetramethylcyclopentadienyl group.

16. (New) The production method according to Claim 12, wherein the metallocene complex is a samarium complex.

17. (New) The production method according to Claim 12, wherein the ionic compound is one or two or more selected from triphenylcarbonium tetrakis(pentafluorophenyl)borate, triphenylcarbonium tetrakis(tetrafluorophenyl)borate, N,N-dimethylanilinium tetrakis(pentafluorophenyl)borate, and 1,1'-dimethylferrocenium tetrakis(pentafluorophenyl)borate.

18. (New) The production method according to Claim 12, wherein the aluminoxane is methylaluminoxane and/or modified methylaluminoxane.

19. (New) The production method according to Claim 12, wherein the catalyst composition further comprises an organometallic compound of a group I to group III element in the periodic table.